

REMARKS

By this Amendment, claims 1 and 7-9 are amended. Claims 3-6 and 10-39 remain in the application. Thus, claims 1 and 3-39 are active in the application. Reexamination and reconsideration of the application are respectfully requested.

The Applicants thank the Examiner for kindly indicating, in item 5 on page 6 of the Office Action, that claims 10-37 are allowable.

In item 2 on page 2 of the Office Action, claims 1, 3-6 and 38 were rejected under 35 U.S.C. § 102(e) as being anticipated by Clatanoff et al. (U.S. 5,519,451). Further, in item 3 on page 4 of the Office Action, claims 9 and 39 were rejected under 35 U.S.C. § 102(e) as being anticipated by Heimburger (U.S. 5,995,154).

Without intending to acquiesce to these rejections, independent claims 1 and 9 have each been amended in order to more clearly illustrate the marked differences between the present invention and the applied references. Accordingly, the Applicants respectfully submit that the present invention is clearly patentable over the applied references for the following reasons.

The present invention provides a deinterlacing method and apparatus which measure a quantity of motion of a deinterlacing target field, and perform a filtering process to generate an interpolation pixel for the deinterlacing target field. Further, the deinterlacing method and apparatus compare the quantity of motion of the deinterlacing field with predetermined thresholds, and decide a filter coefficient of a filter used in the filtering process from predetermined filter coefficients based on the comparison result.

For example, the present invention provides that thresholds TH1, TH2 and TH3 are set (where $TH1 < TH2 < TH3$), and when the quantity of motion of the deinterlacing target field is larger than TH3, a filter coefficient corresponding to a moving picture is selected. The present invention also provides that when the quantity of motion of the deinterlacing target field is smaller than TH1, a filter coefficient corresponding to a still picture is selected (see, for example, lines 5-23 on page 32 and lines 6-19 on page 34 of the original specification, corresponding to line 10 on page 33 to line 6 on page 34 and line 15 on page 35 to line 3 on page 36 of the substitute specification, respectively).

Accordingly, the deinterlacing method and apparatus of the present invention can convert an interlaced image into a progressive image by using a filter.

Claim 1 recites the deinterlacing method of the present invention. The deinterlacing method of claim 1 comprises, in part, comparing the measured quantity of motion of the deinterlacing target field with predetermined thresholds, and deciding a filter coefficient of a filter used in the filtering process from predetermined filter coefficients based on the comparison result.

In contrast to the invention of claim 1, Clatanoff et al. discloses, as indicated by the Examiner, a method for determining a motion signal k detected by a current field and a preceding field of a luminance signal Y , and combining the luminance signal with the motion signal k to generate an interpolated output of the luminance signal based on $Y = KA + (1-k)B$.

Accordingly, Clatanoff et al. merely discloses a method for combining the luminance signal Y with the motion signal k . Clatanoff et al., however, clearly does not disclose or suggest comparing the measured quantity of motion of the deinterlacing target field with predetermined thresholds, and deciding a filter coefficient of a filter used in the filtering process from predetermined filter coefficients based on the comparison result, as recited in claim 1.

Therefore, claim 1 is clearly not anticipated by Clatanoff et al. since Clatanoff et al. fails to disclose each and every limitation of claim 1.

Accordingly, the Applicants respectfully submit that claim 1, as well as claims 3-8 and 38 which depend therefrom, are clearly allowable over Clatanoff et al.

Claim 9 recites the deinterlacing apparatus of the present invention. As mentioned above, claim 9 was rejected as being anticipated by Heimburger.

The deinterlacing apparatus of claim 9 comprises a filter unit for performing a filtering process on a deinterlacing target field, and a difference operation unit for measuring a quantity of motion of the deinterlacing target field. Furthermore, the deinterlacing apparatus of claim 9 comprises a filter coefficient setting unit for comparing the measured quantity of motion of the deinterlacing target field with predetermined thresholds and deciding the filter coefficient of the filter unit from predetermined filter coefficients based on the comparison result.

Thus, similar to the invention of claim 1, the deinterlacing apparatus of claim 9 can convert an interlaced image into a progressive image by using a filter.

In contrast to the invention of claim 9, Heimbürger, as indicated by the Examiner, discloses a process for carrying out the interpolation of a pixel of a frame by a median filtering pertaining to the values added by two motion compensated linear filters and a motion compensated median filter, when a motion vector between frames is non-zero or when the motion vector is zero but the confidence accorded to this vector is less than a given threshold.

Accordingly, Heimbürger merely discloses a process for carrying out a motion compensation of the pixel of a frame, an interpolation of the pixel of a frame, and a median filtering pertaining to the values obtained by the interpolation, when a motion vector between frames is non-zero or when the motion vector is zero but the confidence afforded to this vector is less than a given threshold.

Heimbürger, however, clearly does not disclose or suggest a deinterlacing apparatus which comprises a filter coefficient setting unit for comparing the measured quantity of motion of the deinterlacing target field with predetermined thresholds and deciding the filter coefficient of the filter unit from predetermined filter coefficients based on the comparison result, as recited in claim 9.

Therefore, claim 9 is clearly not anticipated by Heimbürger since Heimbürger fails to disclose each and every limitation of claim 9.

Accordingly, the Applicants respectfully submit that claim 9, as well as claim 39 which depends therefrom, are clearly allowable over Heimbürger.

Because of the clear distinctions discussed above, it is submitted that the teachings of Clatanoff et al. and Heimbürger clearly do not meet each and every limitation of claims 1 and 9.

Furthermore, it is submitted that the distinctions discussed above are such that a person having ordinary skill in the art at the time the invention was made would not have been motivated to modify Clatanoff et al. and Heimbürger in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1 and 9.

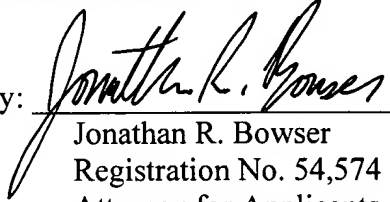
Therefore, it is submitted that the claims 1 and 9, as well as claims 3-8 and 38-39 which depend therefrom, are clearly allowable over the prior art as applied by the Examiner.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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